VOLUME 60
NUMBER 4

WHOLE NO. 280
1946

Psychological Monographs

JOHN F. DASHIELL, *Editor*

Children's Preference for Goals Easy or Difficult to Obtain

By

IRVIN L. CHILD

Department of Psychology and Institute of Human Relations, Yale University

Price $.75

Published by

AMERICAN PSYCHOLOGICAL ASSOCIATION, INC.

Publications Office

1515 MASSACHUSETTS AVE., N.W., WASHINGTON 5, D.C.

VOLUME 60
NUMBER 4

WHOLE NO. 280
1946

Psychological Monographs

JOHN F. DASHIELL, *Editor*

Children's Preference for Goals Easy or Difficult to Obtain

By

IRVIN L. CHILD

Department of Psychology and
Institute of Human Relations,
Yale University

Published by

THE AMERICAN PSYCHOLOGICAL ASSOCIATION, INC.

Publications Office

1515 MASSACHUSETTS AVE., N.W., WASHINGTON 5, D.C.

TABLE OF CONTENTS

CHILDREN'S PREFERENCE FOR GOALS EASY OR DIFFICULT TO OBTAIN

Chapter I

Introduction

That organisms tend to choose the easiest route to their goals is a generalization widely accepted as valid for both human and animal behavior. It has been termed the principle of least effort (10), and a variety of experimental evidence has been offered in support of it. From the principle of least effort there might be drawn the following implication: when an organism is confronted with a choice between two goals, of equal intrinsic attractiveness to him, he will choose the goal which can be attained with the least effort.

This possible implication of the principle of least effort has, however, been contradicted in a general principle suggested by H. F. Wright (11, 12). He has proposed that the presence of a barrier between an organism and a goal increases the valence of that goal. Other things being equal, then, and if distance is classed as a barrier, a goal that is more distant should be preferred to an otherwise equally desirable goal close at hand. This conclusion, contradictory to the implication drawn above from the law of least effort,[1] might appropriately be termed the "principle of greater effort". There is no doubt that evidence indicates that human beings, at least, do sometimes behave in the way that this second principle suggests.

Setting up as general principles two statements that appear to have contradictory implications, leads to obvious theoretical difficulties. So long as both of the contradictory generalizations are taken as basic principles, the only resolution appears to be a statement that under certain circumstances one principle holds true, and under certain other circumstances the contrary. This is essentially the resolution that Wright offers in suggesting that the law of least effort holds true where there is a single goal, but the law of greater effort when there are two or more (11, p. 29). But such a resolution, even if the implications as to fact should be verified, would be only a first step in the direction of a more fundamental inquiry into the circumstances of the validity of each principle.

It appears much more useful to regard both "principles" as merely empirical generalizations, each valid under certain conditions, and then to seek for a single set of principles which may be valid under both sets of circumstances and capable of explaining the differences in resultant behavior.

One part of this task has already been done. The phenomena generally subsumed under the "principle of least effort" have already been shown to be derivable from more basic characteristics of behavior (4; 5, pp. 294f.; 8, pp. 47f.); this derivation indicates that the behavioral facts denoted by this principle may well be entirely dependent upon the organism's previous learning. It is the purpose of this article to make a similar, though less uniform and simple, theoretical advance with respect to the "principle of greater effort", and to report certain experimental findings which relate to the interpretation which will be offered.[2]

[1] Not contradictory to the law of least effort itself, however, for Wright does not deny that with several routes to a single goal the easier one will be chosen.

[2] There is another possibility which must be recognized. The contradiction between these two principles is purely an empirical one: from the presence of a barrier one principle predicts a

SOURCES OF A PREFERENCE FOR MORE DISTANT GOALS

Would a preference for more distant goals, under certain circumstances, be predicted from general psychological principles, without the *ad hoc* assumption that such a preference represents in itself a separate basic principle? Consideration of this question leads readily to the recognition of several circumstances in which such a prediction would be made.[3]

Immediate satiation. If a person is right at one goal and has just been obtaining satisfaction from it, satiation may so reduce the attractiveness of that goal as to increase the likelihood of his moving off toward some other and more distant goal. Thus a child who has been eating away at his hoard of candy and still has a good deal left may, at the moment, be more likely to go out and play than he was a few minutes before, because of temporary satiation of this competing interest.

A resultant of approach and avoidance gradients. It has been assumed by Lewin (6, p. 92), Miller (7), and others that tendencies to approach and avoid objects both decrease in strength as distance from the object is increased, and that the avoidance gradient decreases more rapidly than the approach gradient. Experimental evidence has been obtained for these assumptions in rats (1, 7). If they also hold true generally for human beings, they would lead to the prediction that of two goals equally attractive and equally to be avoided, the one more distant at the moment of choice should be chosen.

A result of previous learning. If a preference for the nearer goal is itself learned, it is apparent that different conditions of learning might lead instead to the development of a preference for more distant goals. Child and Adelsheim (2) have outlined some of the conditions that might lead to such learning. They mention the following:

(1) Previous experience of repeated satiation with available goals might generalize to a new available goal, so as to immediately diminish its attractiveness in comparison with a more distant goal.

(2) The activity required to reach a more distant goal is sometimes rewarding. The activity required in the experimental situation may be reacted to as similar to previously enjoyed activities, and the more distant goal may then be chosen because of the double reward to

lessened probability, the other an increased probability, of movement towards the barred goal. The two principles are not contradictory theoretically; for while they predict opposite consequences from the same antecedent, they do so by postulating different intermediate effects which are perfectly compatible with each other and might be capable of separate measurement. The "law of least effort" as interpreted above deals with the production of an avoidant tendency in reaction to the barrier; Wright's principle deals with an increase in approach tendency in reaction to the barrier. These two assumed effects have opposite results for behavior, but their simultaneous production by the same cause is perfectly possible. If the variation of these two effects with strength of drive, magnitude of the barrier, etc. were different, clear predictions as to fact could be made from a theory which assumed both effects to be primary principles. An excellent step in this direction is taken by Wright (12, pp. 391f.) in his effort to explain the greater preference for a distant goal in verbal-choice than in action-choice situations; he assumes here that the inhibitory effect of a barrier is greater the more realistic the situation. While this point seems well taken, the general possibility of reconciling the two principles as basic principles is not considered in the present paper, for the thesis here is that neither principle is a basic principle and that the sources of the "principle of greater effort", and therefore its quantitative relationships, are extremely variable.

[3] Wright deals with some of these circumstances, in different terms, in his section on interpretation (11, pp. 108-130). He mentions them as possible interpretations of what he regards as a law of behavior. The position taken here is that no single law is involved, and that only when and to the extent that such circumstances as these are present will it be true that a more distant goal is preferred.

be obtained in that way—the goal object itself and the enjoyable activity along the way.

(3) In certain situations in everyday life, a goal that is harder to attain is in fact a more desirable one. If such experience is generalized to the experimental situation, the more distant goal may then be chosen because of an expectation that it will be better or larger than the more accessible one (even though in fact it is not).

(4) Finally, the child often receives rewards of social approval for achieving the difficult, and punishments of social disapproval for choosing the easy. If the effects of this experience are generalized to the experimental situation, choice of the more distant goal would be motivated by a secondary drive for achievement, and might then be reinforced by the internal satisfaction obtained.

The present study of the choice between near and distant goals proceeded from an assumption that preference for a more distant goal, when found, is probably in considerable part a product of this latter group of factors, those resulting from previous learning. The experiment was planned so that if this assumption was correct, certain influences of previous learning would be exhibited.

1. Variation with age. Child and Adelsheim (2) found evidence that nursery school children very rarely choose the more distant of two goals. Wright (11) had reported a somewhat higher frequency of choice of the distant goal by nursery school children, although not nearly high enough to warrant concluding that there is a general tendency among them to prefer the more distant goal. That very young children should rarely show this preference is not surprising if the preference is interpreted as a result of learning, for it may well be that the relevant learning does not take place very effectively in the early years of life. In that case, one would expect an increase in the frequency with which children preferred the more distant goal as they grew older. The present study does not include any longitudinal observations on single children as they grow older, but it does sample children of various age groups from the first grade through the seventh grade of grammar school. It does permit some conclusions about the change in behavior in the experimental situation with increased age.

2. The assumption that the preference for a more distant goal resulted from previous learning led to the introduction of several experimental variables, as follows:

a. Sex of child. To the extent that the secondary motives leading to this preference are those of achievement, the last mentioned among the sources of this preference listed above, it might be expected that the preference would appear more often in boys than in girls because of the greater emphasis in their upbringing upon achievement.

b. Sex of the experimenter. To the extent that the motives leading to this preference are learned in social interaction between the child and a particular parent or his teachers, the preference would be more likely to appear the more similar the experimenter was to those who are present at the time of the training. Two experimenters were used, a man and a woman.

c. The nature of the barrier which stands between the subject and the more distant goal. While no clear prediction was made about the effect of varying the nature of the barrier, it was believed that valuable information about the sources of the preference might be obtained by varying it. In addition, varying the bar-

rier would aid in broadening the generalizations that might be justified by the experimental data. For this reason, two different kinds of barrier were employed, a ladder and a table.

d. The instructions given to the child. On the assumption that the previous learning relevant to choice in this situation had often been accompanied by statements by adults about the child's doing something hard or easy, it was predicted that introduction of these words in the instructions would make more likely the evocation of any secondary motives. The instructions were varied, therefore, so that half of the subjects were told explicitly by the experimenter that the choice was between a hard and an easy way of getting to a piece of candy, while the other half were given instructions in which these or similar words were not included.

3. In an effort to determine what understanding of the situation and what motives prompted preference for either the near or the distant goal, the children were interviewed about the reasons for their choice. The material obtained in this way provides evidence of the variety of forces leading to each of the alternative preferences in the experimental situation.

4. On any hypothesis at all about the origin of the preference for a near or distant goal, it would probably be supposed that either preference might be evoked in the child sometimes, and not at others. In order to broaden somewhat the generalization that could be made, experimental observations were made on each child twice, on different days. But this fact also permits an exploration of factors determining consistency in preference, and this becomes a separate problem which is reported on in a later section of the paper.

Chapter II

Technique of Investigation

The basic technique of these experiments was to place children in the position of having to choose between two desirable goals, one of which was more accessible than the other, and to observe their reactions. The important uniformities in the procedure and the variables introduced will be described below. At the end of this chapter, the way that the several variables were integrated in the experimental design will be described.

GOAL OBJECTS

The goal objects throughout the experiment consisted of pieces of candy. The candies were all chocolate-dipped soft creams of approximately uniform size and shape (cream candies of the sort found in standard assortments of chocolate candies sold in pound boxes). Several different candies of this type were used in this experiment, but insofar as possible, the candies used for a single classroom were identical. Because of difficulties of obtaining candy in wartime, it was not possible to have even this uniformity throughout. In every case, however, the pieces of candy offered to a single child were all of a single type. Candies of a single type varied somewhat in size and shape; in selecting the two pieces of candy for a child to choose between, an effort was always made to find two pieces that would not be discriminably different.

While an effort was thus made to have the two goal objects in fact identical, the child was never informed whether or not they were identical. The few children who asked were answered noncommittally with such a statement as: "Well, I don't know. They look about the same."

The technique used in this experiment differed considerably at this point from that used in Wright's original experiments and in those by Child and Adelsheim. Wright had argued that if two goal objects were identical, then the law of least effort would operate, and for that reason, in most of his experiments, he used two goal objects which differed, for example, in shape. The same procedure was followed by Child and Adelsheim. For purposes of direct comparability with the previous experiments, it would have been desirable to have clearly different goal objects in the present experiment too. But that seemed quite incompatible with the objective of studying the variation of preference for distant goals with age. If, for example, the percentage choosing the more distant goal rose from a low percentage at a young age to about 50% as a maximum, it would not be possible with clearly distinctive goal objects to conclude that there was any greater tendency in the latter case to prefer distant objects. For the results might equally well be explained by the assumption that with increasing age, the particular differentiation (such as color or shape) between the goal objects had become important as a basis for choice. To be sure, if the percentage of children taking the distant object varied with age from near zero to near 100%, this explanation would not be possible. But the author did not believe this outcome sufficiently likely to be willing to risk the experiment's turning out to be quite meaningless for the question it was designed to test.

SUBJECTS

The subjects available for this experiment consisted of the entire body of students enrolled in certain grades in two public schools.[1] In School A, grades 2 through 7 were used; in School B, grades 1 through 6 were used. Out of the total number of subjects thus available, a certain number were eliminated because of absence on one or both of the days the experiment was conducted with their classroom, or because they did not wish to take a piece of candy. (The few children falling in this latter category were ones who reported they were not allowed to eat candy because of the condition of their teeth, or because their parents disapproved.) The total number of subjects who were used for the entire study was 603, including 298 boys and 305 girls. Their distribution by school grade, for each of the two schools, is given in Table 1.

TABLE 1

Number of Subjects Obtained From Each School Grade, in Each of Two Schools Used

	School grade						
	1	2	3	4	5	6	7
School A	39	39	42	48	43	62	0
School B	0	57	76	36	69	64	28
Total	39	96	118	84	112	126	28

PHYSICAL ARRANGEMENTS

The experiment was carried on in a room allotted by the authorities in each school for the purpose. In one school it was the teachers' reading room; in the other school it was a basement room sometimes used for medical and dental examinations. Furniture already in the room, or brought in from elsewhere in the school, was employed to give distinct physical arrangements for the choice between a nearer and more distant goal, as follows:

Table barrier. Here the child was asked to stand in front of one end of a library table. One piece of candy was placed within his immediate reach at the center of that end of the table; the other was placed at the center of the opposite end of the table, so that to get it the child would have to walk half way around the table.

Ladder barrier. Here the child was asked to stand in front of a series of shelves in front of which there also stood a library ladder. One piece of candy was on a low shelf within the child's immediate reach. The other was on a high shelf, so that in order to reach it the child had to walk up the library ladder. (The type of ladder referred to consists of a portable set of three steps which are solidly built and have the shape of ordinary stairway steps; they do not have the aspect of instability or danger that ordinary ladders might present to young children.)

[1] The writer is greatly indebted to Dr. J. Allen Hickerson of the New Haven State Teachers College, and to the principals and teachers of the training schools associated with the college, for their generous cooperation in obtaining subjects and conducting the experiment.

PROCEDURE AND INSTRUCTIONS

The children came from their classrooms one or two at a time, and were first seated on a chair in the hall outside the experimental room. Meanwhile, two pieces of candy were placed in proper position according to the kind of barrier that was to be used with the child. One of the experimenters then took the child into the room while the other waited outside.

First day. On entering the experimental room, the child was first asked for his name, age and birthday. The experimenter then said to the child: "All right. Now would you please stand over here," pointing towards the place where the child was to stand. The instructions from then on were of two different sorts, each used with half of the children. The two sets of instructions differed in the presence or absence of the cue words *hard* and *easy*. They will, therefore, be referred to as the cued and non-cued instructions. The instructions used in the ladder situation will be quoted here. The instructions used in the table situation are exactly parallel, with only the obvious changes necessitated by the nature of the physical arrangement.

Cued instructions: "Do you see those two pieces of candy? That one is hard to get because you have to climb the ladder in order to reach it. This one is easy to get because you can reach it right here. (Pause) Well, you may take either one you want, the hard one or the easy one."

Non-cued instructions: "Do you see those two pieces of candy? You could get that one by climbing up the ladder. You could get this one by reaching right over there. (Pause) Well, you may take either one you want."

Statements or questions made by the child were recorded. When the child had taken a piece of candy, he was allowed (or, if necessary, invited) to eat it on the spot. While the child ate the candy, the experimenter attempted to carry on an irrelevant conversation, about classroom activities for example, in order to put the child at ease. After finishing the candy, the child was allowed to return to his classroom. A few children who did not want to eat the candy at the time were allowed to have the candy put aside in an envelope to be given to them later. A few children who did not want to eat it at all were dropped out of the experiment at this point.

Second day. On another day[5] the child returned to the experimental room and was again given a choice between two pieces of candy. The procedure differed from the first day's in two important respects:

(1) The instructions given to the child this time were: "Do you see those two pieces of candy? Well, you may take either one you want." Neither a description of the routes to the candy nor the words, hard and easy, were introduced on the second day with any of the children. In the case of the few children who did not at once see both pieces of candy (these were children confronted with the ladder arrangement the second day, following the table arrangement the first day), the experimenter pointed to each piece and said, "There".

(2) After the child had started eating the candy on this second day, the experimented conducted an interview instead of irrelevant conversation. The interview was begun with the question: "How did you happen to take this (or that) piece instead of that (or this) one?" If this question had to be re-phrased, the forms used were: "How did you decide

[5] An effort was made to have this the second day after the first trial, but there was considerable variation.

on this piece rather than that piece?" and "How did you choose this piece rather than that one?" These initial questions were followed up with succeeding questions which varied according to the responses the child had already made. An attempt was made to standardize somewhat the form of the succeeding questions.

EXPERIMENTER

Two experimenters worked together throughout the experiment.[6] For each session with a single child, one experimenter was in the room with the child, while the other waited in the hall outside. The experimenters were of different sex, and it was hoped that differences in behavior of the children with the two experimenters might reflect differential reactions to men and women.

EXPERIMENTAL DESIGN

The student body of several different grades in each of two schools were used as subjects, with the aim of observing differences in preference from one age level to another and determining whether these changes were consistent in the two schools. For this purpose, it was necessary to have approximately the same conditions in the experimentation for each grade group.

At the same time, the experiment was designed to explore the effect of four major variables on the preference: sex of the subject, type of barrier, instructions, and experimenter. A design was worked out which would insure that the various combinations of these variables would appear with approximately equal frequency in each grade group in each of the two schools.

Since the entire body of students in each grade was being used as subjects, distribution by sex was not subject to control. Each grade-sex group was then treated as follows: The group was divided into two sub-groups according to the nature of the instructions on the first day (instructions the second day were the same for everyone). Each of these two sub-groups was then divided up into four possible combinations of experimenter and type of barrier on the two days. For each grade-sex group there were thus eight combinations of experimental treatments. These were assigned in a predetermined order to the first eight subjects obtained from that grade-sex group. Then if there were more subjects, they were assigned among the eight treatments in another pre-determined order, and so on until the subjects were exhausted. In this way the distribution among experimental treatments remained approximately equal for each grade-sex group, and in any case the differences in treatment between grade-groups were not systematic ones.

For certain purposes in the following presentation of results, the various grade groups will be compared without any attention to the experimental variations within them. For certain other purposes the grade-groups will be thrown together for analysis of the effect of the experimental variables introduced in each one.

[6] Irvin L. Child and Elmer H. Potter

Chapter III

Change in Preference with Age

In considering the variation in behavior in this experiment with age, it would be possible to divide the children into exact age groups. Another possibility would be to compare the results for children in each of the several grades in each school. The fourth-grade group, for example, is on the average about one year older than the third grade, and one year younger than the fifth grade. There is some overlapping in age between the grades, but not a great deal. This latter method of treating the data was chosen because of the fact that children in a single grade tend to some extent to act as a social unit, as will be described later.[7]

1) In the lowest grades, the percentage choosing the more distant goal is low, yet not close to zero. It is about 20%.

2) With increasing age, there is an increase in the percentage of children choosing the more difficult goal; the maximum is reached or closely approached in the third and fourth grades in one school, but not until the fourth grade or after in the other school.

3) After this maximum has been attained, there is a tendency for the proportion to fluctuate irregularly in succeeding years. This tendency is seen in only one school, School A.

In Figure 2 are presented the com-

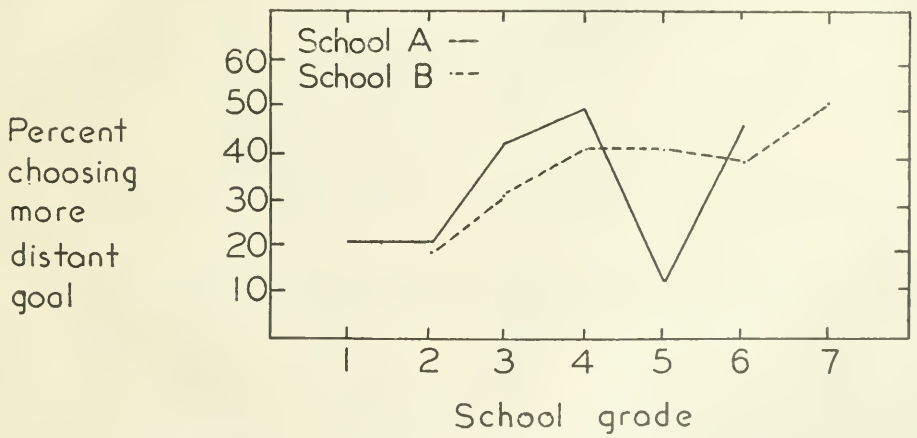

Fig. 1. Changes with school grade in choice of more distant goal on first day.

In Figure 1 is presented the percentage of subjects choosing the more distant goal in each grade group in each of the two schools on the first day of the experiment. The following results should be noted.

parable data for the second day of the experiment, on which a choice was made for a second time by each child. These results confirm the three conclusions given above. Despite a good deal of shifting of the exact figures, there appears a gradual increase with age in the proportion taking the more distant goal up to a maximum not far above 50%, and on the second day both schools show

[7] These grade groups are not always composed of a single classroom. Some grades were represented by two classrooms in a single school. In addition, these schools have some split-grade classrooms.

a very marked tendency toward irregularity in the upper grades.

Each of these results is of interest in connection with the general problem being investigated. They will be considered here in turn.

1) The finding that in early primary grades a small proportion of children prefer the more distant goal confirms the results of Child and Adelsheim (2) with goals is much more common among younger groups of children.[8]

2) Among pre-school children, Wright apparently found no tendency for the preference in a near-far choice situation to change with age. Neither did Child and Adelsheim. Here in these results, then, appears for the first time clear evidence of a change in preference with age, an increased preference for more distant

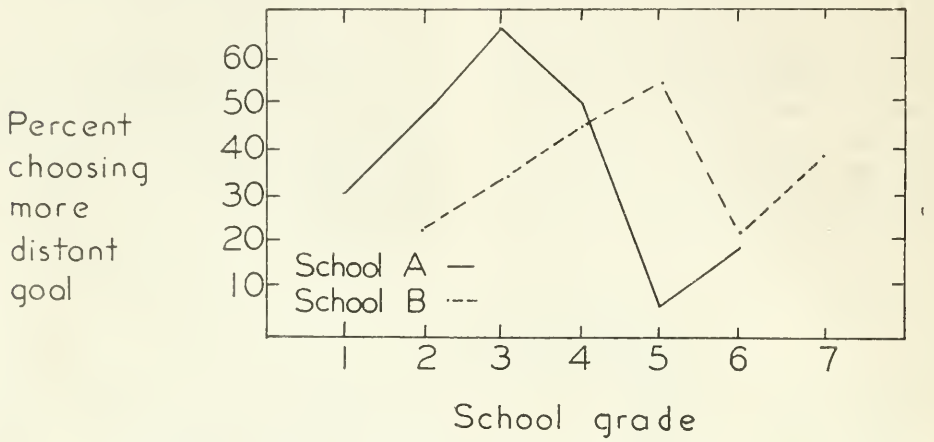

FIG. 2. Changes with school grade in choice of more distant goal on second day.

nursery school children. Repeating a number of experiments done by Wright (11), Child and Adelsheim had corroborated his results where he had found a majority preference for the nearer goal, and had results disagreeing with his in those cases where he had found a majority preferring the more distant goal. The reason for this difference in results between Child and Adelsheim on the one hand and Wright on the other cannot yet be satisfactorily understood, but the evidence of the present experiment on children in the primary grades tends to confirm the findings of Child and Adelsheim as somewhat the more general ones —that is, to confirm the generalization that preference for the nearer of two goals with increasing age to a point somewhere above 8 or 9 years.

This finding seems to suggest that the constant low frequency of children preferring the more distant goal at early ages may not reflect a real choice of a more distant goal because it is more distant, but rather results from some other factor relatively constant with age. This factor might be, for example, the presence of a certain proportion of children who evaluate carefully the appearance of the two pieces of candy and happen in a certain number of these cases to de-

[8] This confirmation cannot be considered conclusive, however, because of the fact that the two goal objects in the present experiment were not conspicuously different, as they were in the other experiments referred to.

cide that the one that is farther away is the one that looks the more attractive. It could indeed be that an increase in interest in differences between pieces of candy might account for the rise in preference for the distant goal with age during the primary grades, so far as the results thus far presented are concerned (since the preference never rises far above 50%). This interpretation can, however, be argued against on the basis of the interviews with the children, the results of which will be reported in a later chapter.

3) The irregularity of results for the higher grades is of interest from the point of view of methodology rather than of conclusions, and the results of the interviews will be anticipated briefly here to indicate what is responsible for the irregularity. What happened was that in the higher grades the children communicated quite freely with each other about the experiment and made speculations about its purpose. The members of a single classroom tended therefore to arrive at a group decision about what the desirable behavior in the experiment was, a decision which would then be carried out by a large proportion of the members of the group. In one classroom, for example, there was a widespread belief that the experiment was an effort to get the children to take medicine which was concealed in the piece of candy that a child would be most likely to take, that is, the nearer one. Needless to say, most of the children in this room took the more distant goal. In another classroom, on the other hand, it became widely believed that the experiment was a test of politeness, and that the polite thing to do was to take the nearer.

Despite the fact of group decision, results from the higher grades could be used to give a reliable indication of the relative frequency of the one choice or the other, provided there were a sufficiently large sample of groups. But there were very few groups. The irregularity of the results for the higher grades, then, cannot be taken as evidence of any basic tendency toward irregularity, but simply as a consequence of the very large sampling error that results from an extremely small sample. The experiment as conducted was competent then, for tracing reliable trends in the early primary grades where the responses of the individual children were for the most part independently determined. But it does not permit any reliable conclusions about trends in the higher grades.

Despite this tendency toward group decision, there still remains some variation in each of the upper grades. On the assumption that the variation was likely due to the same sorts of variables that operated in the absence of group decision, the results from all the grades have been used together in evaluating the results of the experimental variables. In connection with that aim, the effect of group decisions is likely to be merely that of reducing the reliability of the results.

Chapter IV

Influence of the Experimental Variables

This experiment was designed first to test for possible changes in preference for a distant goal with age; results on this question were reported in the preceding chapter. The experiment was designed secondly to give information about the influence of the following variables on the frequency of preference for the more distant goal: sex of the subject, sex of the experimenter, type of barrier, and a variation in the form of the instructions. Results on the effects of these variables will be reported in this section and in that order. Under each experimental variable, the influence observed in the first day of the experiment will first be reported; second (where relevant) the influence of the first day's variable on behavior the second day; and finally the effect of any variation introduced on the second day.

This section will for the most part deal only with the bare objective facts about the observed variation of preference with variation in the experimental variables. Interpretation of these results is largely dependent upon the statements made by subjects when interviewed about the reasons for their choice. For this reason, questions of interpretation will be dealt with later.

Sex of the Subject

The variation with sex in preference for more distant goals is shown in Figure 3. In the first day of the experiment, the frequency of this preference in boys is more than half again as great as it is in girls. On the second day, the difference is only slightly smaller. Both these differences are highly significant statistically; upon application of the analysis of variance, as described at the end of this chapter, both these differences were found to be significant at far above the the one per cent level. Boys, then, under the variety of conditions of this experiment are clearly more prone than girls to choose the more distant goal.

Sex of the Experimenter

The variation in choice of the more distant goal according to which experimenter was working with the subject is shown in Figure 4. There is a clearly consistent difference. Subjects who worked with the woman experimenter the first day were more likely to choose the more distant piece of candy than subjects who worked with the male experimenter. The effect of this influence on the first day of the experiment tends to persist into the second day regardless of who the experimenter is on the second day; the difference between the experimenters on the first day thus appeared to have a persisting effect on the choices made by the children on the second day. Thirdly, preference for a more distant goal is more frequent the second day in those children who at that time are working with the woman experimenter.

The first and third of these differences have been tested statistically through analyses of variance which are reported in the last section of this chapter. The influence of the first day's experimenter on the first day's choice is significant at the one per cent level; the influence of the second day's choice is significant at the 5 per cent level. The other difference has not been tested in an analysis of variance; its level of significance would presumably be found to lie in the same re-

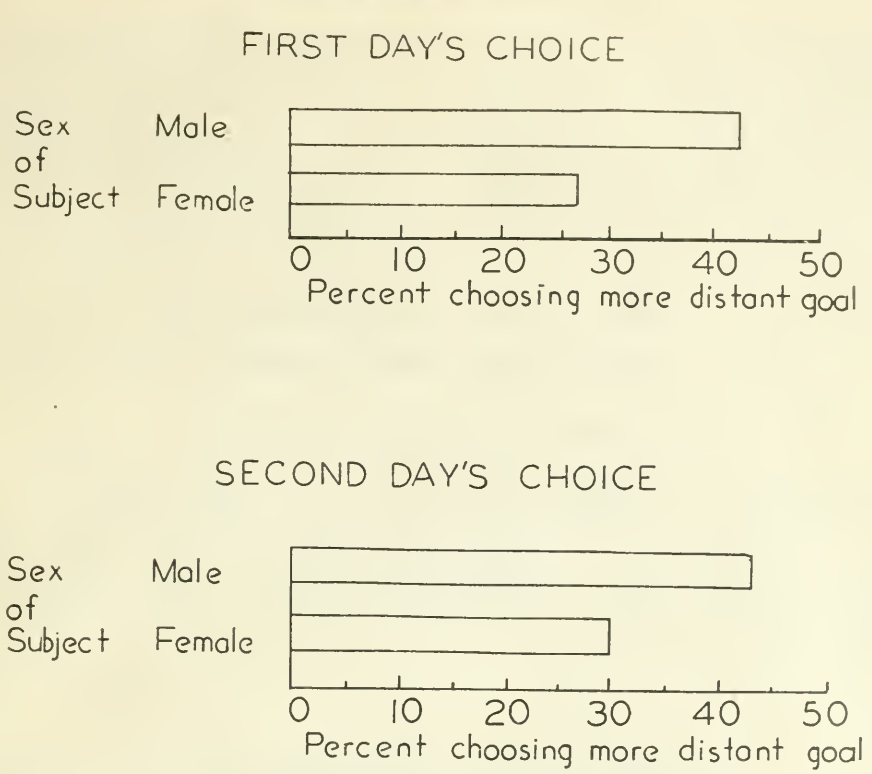

FIG. 3. Sex of subject and choice of more distant goal.

gion as the other two but somewhat lower.

A few words must, at this point, be said in interpretation of these results. The observed fact is that the frequency of choice of a more distant goal varies significantly as between the two experimenters taking part in the study. It will be assumed in the interpretation to be made later that this difference is probably in considerable part an effect of the sex of the experimenters. It is important to note, however, that this interpretation is not in any way subject to statistical test from the present evidence. There is a sample of only one woman and only one man as experimenters. For conclusions about the effect of sex of the experimenter, so phrased and interpreted, to be established as statistically significant, it would be necessary to have an adequate sample of experimenters of different sex. In the absence of such an adequate sample, the interpretation of these results in terms of sex differences must be purely conjectural. Naturally, since the writer was expecting to venture this conjecture, an effort was persistently made to reduce other sources of variation between the two experimenters as stimuli for the children; the procedure to be followed was practiced and observed together by both experimenters in preliminary try-outs, and problems of procedure were frequently discussed. But it is quite impossible by such methods to have any guarantee that relevant aspects of the experimenters' stimulus value, other than sex, have in fact been entirely eliminated.

If the conjecture that this difference is properly attributable to sex should turn out as a result of later experimentation to be probably false, the observed difference remains of methodological interest. For in that case it provides clear evidence of the very large influence, on responses of subjects in such experiments as this, of uncontrollable aspects of the personality of individual experimenters, or of differences in procedure which fail to be eliminated despite persistent effort. Where these unintended variations of procedure are unwittingly allowed to

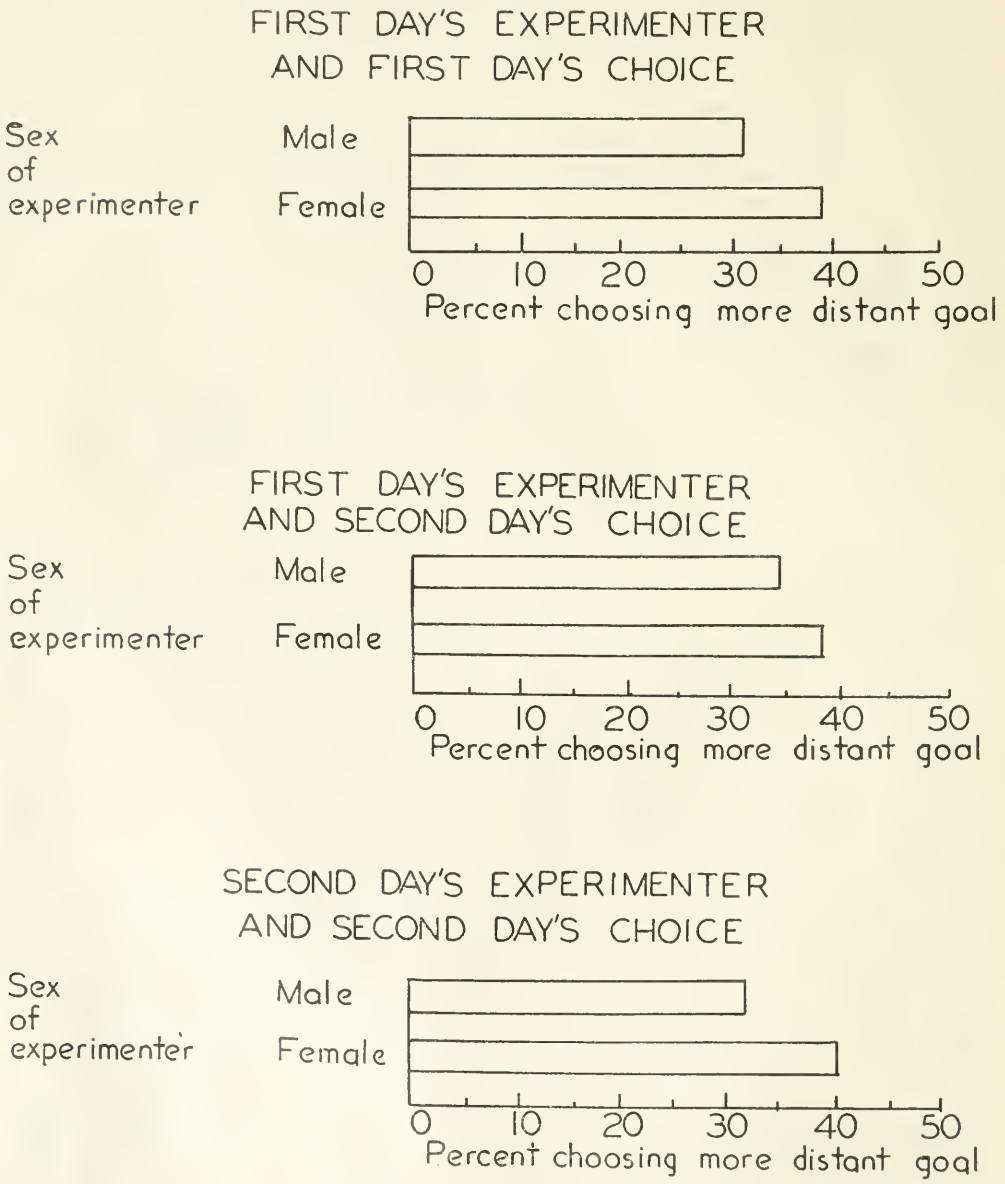

FIG. 1. Sex of experimenter and choice of more distant goal.

vary as between the various experimental treatments, they may of course lead to quite erroneous conclusions.

TYPE OF BARRIER

The influence of the difference between the ladder as barrier and the table as barrier is pictured in Figure 5. It will be observed that the preference for the more distant object is much more frequent when the ladder is the barrier. As in the case of the sex of the subject, the more favorable condition of the variable has an advantage of more than one-half on the first day, and somewhat less than that on the second day. The difference the first day is significant at well above the one per cent level; the differ-

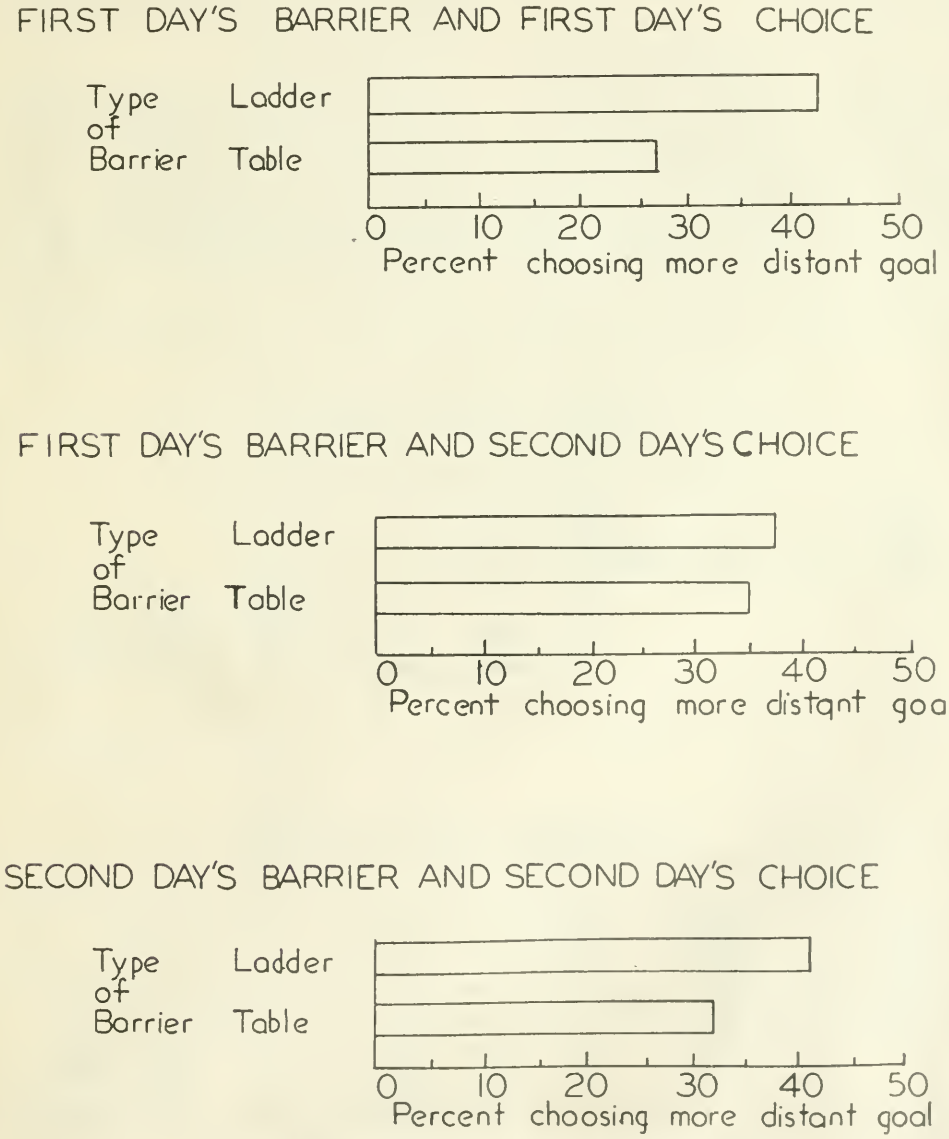

FIG. 5. Type of barrier and choice of more distant goal.

ence the second day is significant only at the 5 per cent level.

The effect of this variable appears to be an immediate one only. While preference the second day shows a slight difference according to which barrier the child was confronted with on the first day, and this difference is again in favor of the ladder as the obstacle, the difference is very small indeed and certainly not statistically significant.

VARIATION IN THE INSTRUCTIONS

Frequency of choice of the more distant goal in relation to the difference between cued and non-cued instructions (the former including the words "hard" and "easy") is shown in Figure 6. The first day the subjects receiving cued instructions show a slightly greater frequency of choice of the more distant goal. Analysis of variance shows that this difference is not statistically significant. When behavior on the second day is related to this same difference in instructions, as a possible persisting effect (instructions were uniform for all subjects on the second day), the direction of the difference is reversed, and again the difference is not statistically significant. Hence there is no evidence whatever of a consistent, over-all effect of the variation in instructions.

Those subjects who gave as a reason for their choice some belief in a differing appearance or quality of the two candies, show certain deviations in tendency from the remaining subjects, and among the deviations is their distribution of response according to the nature of the instructions. An analysis of variance was therefore separately performed for

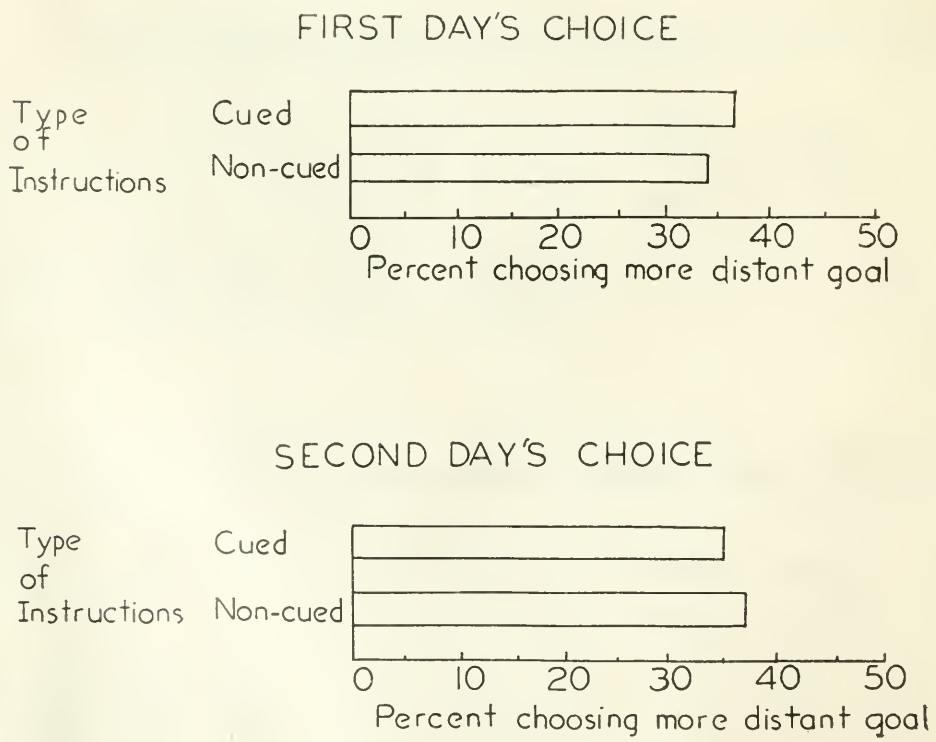

FIG. 6. Type of instructions, and choice of more distant goal.

the remaining subjects, 501 in number, who did not give such a reason.[9] Here the tendency for the cued instructions to be followed by more frequent preference for the distant goal on the first day, is considerably larger and is significant at the 5 per cent level. The failure to find a significant difference originally, therefore, may be attributable to the presence of two distinguishable groups in which the influence of instructions is the opposite. But this very fact of the opposite influence in two different groups would of course limit the generality of this finding. In addition, it is limited by the fact that when the selected group of 501 cases are analyzed with respect to the influence of instruction on their preference the second day, it is found that there is almost no difference between the two groups.

[9] All of the other differences mentioned in this chapter were also tested for significance for the restricted group of 501 subjects who indicated no belief in a qualitative difference between the two pieces of candy. All of the results reported in this chapter were confirmed for this restricted group, with the single exception that the influence of the experimenter on the first day fell slightly short of significance at the one per cent level.

STATISTICAL EVALUATION OF THE INFLUENCE OF EXPERIMENTAL VARIABLES

As has been mentioned earlier in this section, the significance of the effect of the experimental variables was evaluated by the use of analysis of variance. The method of doing so will be described here.

TABLE 2

The Basic Data for Analysis of Effects of Experimental Variables on the First Day, and the Results of Statistical Analysis

Percent of subjects choosing more distant goal on first day, under various combinations of experimental variables

		Male Subjects		Female Subjects	
		Cued instructions	Non-cued instructions	Cued instructions	Non-cued instructions
Male Experimenter	Table barrier	34	24	18	13
	Ladder barrier	50	44	35	24
Female Experimenter	Table barrier	39	47	18	28
	Ladder barrier	50	51	42	33

Analysis of Variance

Source of variation	Sum of squares	Degrees of freedom	Mean square	F
Sex of subject	1024.00	1	1024.00	38.54*
Sex of experimenter	272.25	1	272.25	10.25*
Type of barrier	729.00	1	729.00	27.44*
Type of instructions	30.25	1	30.25	1.14
Interactions	292.25	11	26.57	
Total	2347.75	15		

* Significant at the 1% level (F of 9.65 required).

TABLE 3

The Basic Data for Analysis of Effects of Experimental Variables on the Second Day, and the Results of Statistical Analysis

Percent of subjects choosing more distant goal on second day, under various combinations of experimental variables

		Male Subjects		Female Subjects	
		Cued instructions	Non-cued instructions	Cued instructions	Non-cued instructions
Male Experimenter	Table barrier	43	36	13	21
	Ladder barrier	40	50	24	32
Female Experimenter	Table barrier	33	41	39	30
	Ladder barrier	55	46	37	43

Analysis of Variance

Source of variation	Sum of squares	Degrees of freedom	Mean square	F
Sex of subject	689.06	1	689.06	15.80†
Sex of experimenter	264.06	1	264.06	6.06*
Type of barrier	315.06	1	315.06	7.22*
Type of instructions	14.06	1	14.06	0.32
Interactions	479.70	11	43.61	
Total	1761.94	15		

* Significant at the 5% level (F of 4.84 required).
† Significant at the 1% level (F of 9.65 required).

For each of the two days, the 603 cases were divided into 16 groups according to the sex of the subject, the sex of the experimenter, the type of barrier used on the particular day, and the instructions that were used on the first day. For each of the 16 groups so obtained, the percentage of choice of the more distant goal was calculated. These percentages are presented in Tables 2 and 3. They are presented not only because they are the material used in testing the significance of the results, but also because they have an additional interest of their own. It is possible, for the reader who wishes, to check the consistency of all of the differences reported earlier in this section (and evaluated statistically) by reference to these tables. Each of the major differences is based on 8 comparisons between appropriate pairs selected out of the 16 groups for each day. It is possible from these tables, therefore, to observe how large and how consistently large each of these effects is when the subjects are divided up according to the other experimental variables.

The number of cases on which the 16 percentages are based varies only from 36 to 40 for the first day, and from 34 to 45 on the second day. For both days, then, there seems to be a sufficient approximation to the requirement of homogeneity of variance. The numbers are also large enough, and the percentages close enough to 50, to suggest an ade-

quate approximation to the assumption of normal distribution of sampling errors.[10]

Application of analysis of variance is nonetheless not perfectly straight-forward, because each of the 16 values is in fact based upon the putting together of additional smaller sub-groups, divisible according to schools and grades and, for the second day's results, the way the subjects were treated on the first day. It will be noted that the error variance is much larger for the data of the second day than for the data of the first day, and it is presumably because of this additional heterogeneity not taken account of in the analysis. It is therefore likely that the conclusions drawn from the data of the second day should be regarded as having their significance somewhat understated by this analysis.

It is not possible, however, to avoid this difficulty by breaking the groups up into still smaller sub-groups, because the size of the sub-groups would then become too small and too variable to warrant an application of analysis of variance to percentage values calculated for the sub-groups.

The results of these analyses of variance are also presented in Tables 2 and 3. In both analyses, it was found that none of the interaction variances were significant when tested against the pooled variance of the other interactions. The 11 degrees of freedom pertaining to the 11 possible interactions were therefore pooled for an estimate of error.

[10] As a further precaution, in connection with this assumption of normality, these two analyses of variance were also performed on the percentages as transformed by Bliss' angular transformation (3, pp. 11, 50). While the exact values of F differed from those reported here, the levels of significance reported here were in all cases confirmed.

Chapter V

Reasons Given by Children to Explain Their Choices

At the end of the second day's experimental session with each child, an interview was conducted in an effort to get him to express the basis for his choice between the two pieces of candy available on each day. The statements made by children in these interviews fall readily into three general classes:

(1) Statements which constituted in effect mere descriptions of some aspect of the choice situation, with no explicit indication of the general nature of its significance to the child. For example:

"I took the hard one." Why? "I don't know, but I always like to do hard things."

"Because the other was too hard and I thought I should take that one."

Why? "It depends on how hard it is. If it was too hard I wouldn't take it. Like last time I knew that one was too hard. But if it was a little less hard then I'd take that one." Why? "That would be the one to take."

"Because I don't like to walk around the room. . . . Didn't want to walk."

"Something inside me just said to take that one, and so I did."

"I took the top one." Why? "Because I took the other one last time." Why? "Because that one looked too high."

(2) Statements which indicated a clear belief that the two pieces of candy were in some way different, and that this belief was the basis of the choice. A good many of these statements referred to asserted differences in the appearance of the two candies. Examples of statements of this sort of more general interest will be presented in the discussion below.

(3) Statements which in addition to describing some aspect of the choice situation made explicit in general terms the significance of that aspect to the child. These too will be illustrated below.

The first of these categories is much the more common; it was found in 329 of the 603 subjects. Interest is attached mostly to the second and third categories, however, which included the responses of 102 and 172 subjects, respectively. Most responses of the first type give little clue to the internal determinants of the child's choice. They are certainly in considerable number due to a failure of the interview technique. Responses of the second and third types do give good clues, and ones which may also be valid for many of the children who did not make such responses.

Reasons given in explanation of the choice of the more distant goal will be first considered, and they are the most pertinent to the main problem of this investigation. Reasons given in explanation of the choice of the nearer goal are also of considerable interest, however, and will be considered immediately afterwards.

Reasons for the Choice of the More Distant Goal

In the introductory chapter of this monograph certain theoretical considerations were outlined which would lead to the prediction that, under certain circumstances, the more distant of two equivalent goals would be chosen. That outline will be repeated here, with indications of the extent to which each possibility did actually appear in the statements made by the subjects in the present study.

Immediate satiation. This source is irrelevant to the present study, because

once a subject had started eating the nearer piece of candy he no longer had the privilege of turning to the more distant one. It is of course possible that something like satiation with the nearer piece may have resulted merely from looking at it and reacting to its very immediate accessibility; if so, there is no direct indication of it in the statements made by the subjects.

A resultant of approach and avoidance gradients. Nothing in the procedure used in this experiment was intended to produce any general tendency to avoid either or both goals. That avoidance tendencies were set up in some subjects will be clear from some of the reasons to be quoted below. Such avoidances appeared to be for most subjects specifically connected with one particular goal out of the two available, and in that case mere gradient interactions could not account for a preference for the more distant goal. There was no suggestion of this source in any of the subjects' statements. Moreover, if preferences for the more distant goal were to be accounted for in any very large part by such gradient interactions, it would probably be necessary also to predict a good deal of oscillatory behavior following initial movement toward the more distant goal. Such behavior was in fact rare; while there was often evidence of indecision before overt movement toward either goal was initiated, there was only in a few cases any appreciable hesitation after the beginning of the overt movement.

A result of previous learning. Four different possibilities were suggested under this heading, and each of them does appear in some way in the statements made by the subjects.

(1) Generalization from previous satiation. There is no evidence that in the first experimental session any children were led to choose the more distant goal because of generalization from prior experience of satiation. But the first experimental session did have such an influence on behavior the second day, according to the statements of some few children. For example:

"Because the other time I took the bottom one. . . . I take turns, the bottom one and then the top one."

"Well, last time I took that one so this time I take this one. I like to do something different."

(2) Generalization from previously enjoyed activities. A good many children (22 in number) stated explicitly that the reason for choosing the more distant goal was because of enjoyment of the activity required for reaching it.

"It's much more fun when it's harder to do."

"I like to take fartherest things. It's more fun to go around after something than to just take the thing that's nearest you."

"Because I like to walk. The other day I climbed up the ladder, because I like to do that too." Why? "It's full of fun."

"Because I like to climb." Why? "I like to. I have a lot of trees in my backyard. I'm alway climbing up on them. It's fun."

You like to climb ladders? "Yes, you see we had a ladder in kindergarten and you could climb up to the top and then drop down on the mat."

"Well, there's more adventure to it." To which? "The longer one."

"I'm going to take the high one, because I like to climb. My father's a steeplejack."

It is doubtful whether to many children (who have just walked some distance from their classroom) the activity of climbing three steps or of walking around a table is intrinsically very at-

tractive. It appears probable that, when the possibility of performing or not performing such an act is put up to them so clearly, a certain number of children react by generalization from similar activities they have previously engaged in which were more genuinely enjoyable. This generalization is made explicit by the two children who refer to other kinds of climbing they have previously done and enjoyed.

(3) Expectation of superior goal. A few children, while not definitely believing that the two candies were different, acted on the expectation that the more distant one might be superior.

"I thought they might not be the same, and I thought the one on top might be different." Why did you pick the one on top? "I thought it would be better if they were different candies, because it was farther away and harder to get." Why do you think that would make it better? . . . "Like if there are two sticks I'd take the one that's farthest."

"Well, I know it sounds silly, but I thought that piece might be a little better, since it was a little harder to get." Did you really think they were different? "Well, I don't know. I sort of thought that one might be, since it was harder to get."

"Well, I knew there was some catch to it. I didn't know what the catch was, I still don't know, but I know there's some catch or else they wouldn't do it." How a catch? "There must be some catch. One must be right and the other wrong like." Why did you think this one would be right? "Because you have to do some exercise for it, have to do some work. It's harder to get." Why would that make it the right one? "Well you might get more things if you did the exercise, something like that." Demonstrating how easy it is to reach the nearer piece, "It's too easy. The other one must be the one to take. It's likely to be better."

There were other children who definitely believed the two pieces were different, and expected the more distant one to be better. Some of these were members of one classroom in which the rumor was spread that one piece of candy had castor oil or cod liver oil in it; of children who reported believing the rumor, most supposed that the medicine must be in the nearer piece because that would be the one most children would take. Other instances of belief that the more distant goal would be better follow:

"I thought the hard one would be bigger." Why? "I figured the hard one would always be better."

"The other children would take this one because it's nearest, so the best one would probably be over there."

"I thought there might be a trick, that you wouldn't think anyone would want to climb up the ladder, so I thought I'd take that one."

"I thought the bitter one must be the one right there that you didn't have to climb for, since that's the one most would take, and so I guessed the other."

(4) Social approval or self-approval. Here are to be found the greatest variety of statements, indicating in diverse ways an expectation of praise or self-praise as a consequence of seeking the more difficult goal.

"Because I always take the harder things. The easy things are baby things."

"I guess I didn't want you to think I was lazy."

"Because I thought it was a test of whether you were lazy, so I wanted to prove I wasn't lazy."

"Because it's harder, and I'm not too lazy."

"Because I'm not lazy." You think if you took the other piece it would show you were lazy? "It might make you think so."

"I like to work for something I get—I don't like to be lazy and take the nearest thing."

"Well, I can't explain it. It's just better for you. It shows you're better."

"Well, you have to do something to get the hard thing, and not to get the easy. It's just better to do a little work for something you get."

"Because the other one's too easy to get. With one up high you have to go for it." How do you mean? "You have to get up and get it, climb up for it. The other you can just reach for, and there's no fun in that. Like if there's a piece of candy up in a tree and one down below, I'd take the one up in the tree. It's more fun and you see how good you can climb."

"I thought I'd try the hard one because I didn't know whether I could reach it and I wanted to find out if I could."

"I like to do the hard way." Why? "You learn more." How's that? "Well, not here of course, but if there's something to learn you do the harder thing, the longer way, and you learn more." Like what? "Well, in arithmetic, for example."

REASONS FOR THE CHOICE OF THE NEARER GOAL

Children who chose the nearer piece of candy frequently gave reasons for their choice that were similar in general nature to the reasons other children gave for preferring the more distant piece. Choosing the nearer piece the second day because of a desire to change after taking the more distant piece the first day could and did occur just as well as the opposite. There were some children who said they preferred the nearer piece because they would not have enjoyed the activity required to get the more distant piece. There was even one child who seemed to imply a belief that the nearer piece was likely to be better.

"I always take the nearest—it's a habit. Like when I go to the store I always buy the candy that's nearest, and it tastes better."

Just as in the case of the opposite choice, however, the most frequent and varied reasons are those that indicate an effort to gain social approval or self approval. The most frequent sort of statement is that the choice of the easy goal is the more efficient way of behaving, with sometimes the clear implication that it is therefore the more mature way of behaving.

"Because they're both the same, and if they're just the same, I might as well take the nearest and not use up energy."

"Well, if there are two cars and they're made by the same company and one's sold in one store and one in another, you ought to take the nearest one. It saves trouble."

"Because there is no use climbing up a ladder and doing all that work when the two things are just the same."

"It seems foolish to take such a roundabout way when it's just the same thing." Why? "Well, when you're small I think you take the roundabout way, but when you're older you always try to find the easiest way to do anything." Like what? "Well, in arithmetic you do things all roundabout at first but then later you learn the easiest way to do everything."

"It isn't sensible to go a long way when it isn't necessary. My brother would go a roundabout way probably, but I wouldn't." Why? "Because he's small and doesn't know any better. I imagine when I was his age I would have too, but I can't remember. But when you grow up, you know better and you'd take the nearest one."

Another form that this reason takes is to view the situation as something like an intelligence test, an opportunity to be reasonable or smart by reacting in the most efficient way. Already implied in some of the statements just cited, this reaction is made more explicit in the following ones:

"Well, it's only common sense, to take the nearest one and not climb the ladder."

"Because if there's one thing here and one thing there and both the same, I think it's

stupid to walk around the table to get the other one."

"Because that one's dumb and this one's smart." Why? "It's dumb to take that one because you have to walk around for it, it's smart to take this one that you just have to reach out for. It's nearest."

"Well, I just think it's better. Like if there's a piece of candy in this block and one in the next block, I wouldn't go down to the next block for it." Why? "Well, it's like the teacher said, if your brain's alert you take the one nearest you." When did she say that? "She was talking about health habits. . . . She said like if there are two toys, if your brain's alert, you'll take the one nearest you."

Another sort of reason, also connected with social approval, relates to politeness.

"Because I think it would be more polite to take the closest one." Why? "It would be more polite than reaching way over for one." I see; has anyone told you it would be more polite? "Yes, my mother said so once."

"Well, at table if there's something far away you can just wait until it comes to you. Or if there's one of the same thing here and one there you take the one that's here." Why? "Because it's polite."

"Because my mother always taught me to be polite and take the nearest one to me."

"I guess it's better manners." How do you mean? "Well, you're nearer the nearest one and someone else is nearest the farthest one. So you take the nearest and leave the other one for him, instead of climbing the ladder."

The last statement cited illustrates well the detail in which a generalization from previous experience may be applied to the experimental situation where an observer would feel it was quite inappropriate.

In addition to these reasons which are similar in general nature to those given in support of the choice of the more distant goal, certain additional reasons are given which reflect other sources of anxiety as motivating agents. An occasional child in the first or second grade says that he prefers to take the nearer piece because he is afraid of failure if he tries to get the more distant piece.

"I don't think I could get that one." How do you mean? "I'd be afraid to climb up it. I've never climbed anything."

"I was afraid I couldn't reach the other one."

The other source of anxiety that occasionally appeared was a social one, but concerned with competition and not approval.

"Well, if there's 50 cents here and 50 cents over there and there's somebody over there I'd take the 50 cents over here." Why? "Because if I started to go over there for it somebody might take it before I got there."

"Because like if there was a person over there, they would take that piece and get away before I could get it. So I take the closest and don't try to take the farest."

ANALYSIS OF THE REASONS

The reasons given by some of the children in explanation of their choices may well have been rationalizations, statements devised to satisfy the inquisitive adult when in fact the child had not internally verbalized the sources of influence on his behavior and would not have been able to. But it certainly may be assumed that in many other cases the child's report is a fair approximation to an account of the internal processes that led to his choice. There is no satisfactory way of determining the validity of the individual child's report. For the moment, then, all the reasons will be treated as though they were valid reports, and attention will be turned to analysis of their general content.

There appear to be two important explicit aspects of the reasons given by the children as determinants of their

choice, a cognitive and a motivational aspect. There is also a third important aspect of their stated reasons: implications as to the rewards that followed from making their choices.

(1) *Cognitive aspect.* Each reason does in the first place imply some particular understanding or interpretation of the situation with which the child is confronted. The situation is reacted to as similar to some class of situations with which the child has previously had experience; it is given meaning by generalization from that previous experience. The internal response involved here may well be called a *meaning-reaction.* Some of the meaning-reactions apparently made by the children in this study could be phrased as follows. They interpreted the experimental situation as similar

(a) to being offered a choice of food at table;
(b) to situations in which an adult was standing by ready to criticize if they showed unwillingness to work;
(c) to situations in which they had an opportunity to play and exercise;
(d) to situations in which so much effort was required to reach some goal that indecision resulted;
(e) to situations in which their intellectual competence was being tested, as by their teacher;
(f) to problem situations in which things that looked alike were really different.

In some children these meaning-reactions were apparently made quite consciously, if the reports they made upon interview may be trusted. Many other children presumably made similar meaning-reactions consciously and did not report them; while others still must have made similar meaning-reactions without clear verbalizations even to themselves.

(2) *Motivational aspect.* As a further response to the meaning-reaction, various secondary drives must be assumed to have been aroused. Examples of these may be phrased as follows:

(a) anxiety about being considered, or considering themselves, impolite;
(b) anxiety about being considered stupid;
(c) anxiety about being considered lazy;
(d) a positive drive having the same effect as any of the above—a desire to be recognized as polite, smart, or willing to work;
(e) desire to have fun;
(f) aggression against the adult (which could be satisfied by being rude or lazy);
(g) a desire to get the better piece of candy.

In general, any particular meaning-reaction seemed to be rather consistently followed by a particular kind of motivation. But exceptions occurred. The occasional appearance of aggression as an alternative or supplement to anxiety is an instance. There were also children who said in effect, "This is a situation in which you could have fun climbing the ladder if you wanted to, but I don't feel like it just now."

The children's responses to the experimental situation varied, then, both because of differing interpretations of the situation and because of differing motives resulting from the interpretations and from the general personality of each child.[11]

(3) *Reward aspect.* The motives implied in the children's reasons clearly point to the anticipation of correspond-

[11] No implication is intended that the meaning-reaction is entirely prior to the motivation. Certainly an interpretation of the situation in a way which permitted the expression of aggression by being rude (for example) may have been made because the child came to the situation with a strong latent need for aggression. But the meaning-reaction has been given prior place on the grounds that at least a minimum of meaningful perception of the situation must be assumed to occur before the projective effects of the child's motivation can begin to reshape it.

ing rewards as following from appropriate behavior. Explicit statements about the rewards are absent, since the interview was directed at the determinants of choice, not at the consequences of choice. There is a clear implication, however, that with the arousal of a certain motivation, the child's anticipation that a corresponding reward could be obtained by a particular choice was an important determiner of that choice.

VARIATIONS WITH AGE

Generalized reasons such as have been cited tended to increase with age. Most of the differences among grade-groups were not significant. One very large difference, however, was found.[12] Generalized reasons supporting the choice of the nearer goal were very much more frequent in the fifth, sixth, and seventh grades than in the lower grades. Where generalized reasons in support of the more distant goal appeared to reach a maximum frequency by the fourth grade and perhaps even earlier, those in support of the nearer goal rose sharply from the fourth to the fifth grade and continued at a high frequency.

This finding provides some reason to believe that older children, in choosing the nearer goal, may be doing so as a result of processes considerably more complicated than those operating in the much younger children who make that same choice. The identical response may in younger children result from the processes suggested by the "law of least effort," and in older children from higher-order processes of interpretation and secondary motivation, of the same sort as those that lead to the choice of the more distant goal.

[12] Because of the tendency for each classroom in the higher grades to arrive at a group decision, even this difference cannot be regarded as statistically significant.

Chapter VI

Factors Related to Consistency of Behavior

As each child was put in the experimental situation on two separate occasions, there was an opportunity to study some of the factors influencing consistency of choice.

THE CHOICE OF A GOAL

First of all, it may be noted that there was greater consistency in children who chose the nearer goal on the first day than in children who chose the more distant goal. Of those who chose the nearer goal on the first day, 71% made the same choice on the second day. Of those who chose the more distant goal on the first day, only 49% made the same choice on the second day.[13]

The difference in consistency of the two choices appears to vary with age, as is shown in Table 4. The consistency of the near choice is high in the lower grades, decreases in the middle grades and rises again in the higher grades. The consistency of the distant choice shows an opposite course; it may start low (the small number of cases in the first grade makes the figure there extremely unreliable), is high in the middle grades and then decreases in the upper grades. The effect is that the near choice is much more consistently maintained than the distant choice among the youngest and oldest children, but that in the third and fourth grade there is no evidence of any difference in consistency.

VERBALIZATIONS BY THE SUBJECTS

The role of linguistic responses as determinants of other behavior is a subject that is only beginning to be subjected to experimental analysis. Certain observations made in the present experiment, because they may contribute to the initial exploration of this subject, will be cited here even though they do not lead to conclusions in which much confidence can be placed on statistical grounds. The observations relate to the verbalizations made by the subjects (a) at the time of making their choice on the first day, (b) when interviewed at the end of the experiment on the second day.

Spontaneous Verbalizations on the First Day

In making a choice between the two pieces of candy in the first experimental

[13] It might not, however, be proper to conclude that the choice of the nearer was in all respects more stable. Since the overall percentage of choice of the distant goal was only 36%, the probability of choosing the distant goal on the second day is increased by the evidence that the child has made that choice on the first day, considerably more than is true of the choice of the nearer goal.

Table 4

Consistency of Choice as Varying with Age[14]

		School grade						
		1	2	3	4	5	6	7
Percentage repeating first day's choice on second day when first day's choice is of	Near goal	74	72	65	55	81	88	75
	Distant goal	33	54	64	55	57	35	46

[14] Like other findings referring to change with age these observations are not dependable in the higher grades, because of the factor of group decision. It should be noted that the percentages given for grades 1 and 7 are based on small numbers of cases.

session, some children were silent while others said something. Statements that were made will be divided into two classes:

(a) *Denotative*, essentially consisting of pointing with words, without any description other than what is implied by the words "this" and "that". For example:

"This one."

"I'll take that one."

"I like this one."

(b) *Descriptive* of some aspect of the situation, for example:

"The low one."

"I'll take the farther one."

"The easier one."

The relation of these responses to the consistency of choice is shown in Table 5. Regardless of whether the subject chose the near or the distant goal on the first day, pointing to the chosen object with "this" or "that", in comparison with silence, is associated with an increased likelihood of repeating the choice in the second day's session. A fuller descriptive statement appears to have opposite effects according to which choice is being described. Among those who choose the more distant goal, a descriptive statement is associated with maintenance of that choice on the second day. Among those who choose the nearer goal, those who make descriptive statements are the least likely to maintain their choice on the second day.

It would appear, then, that descriptive statements may serve rather generally in this situation as a part of the mechanism of arousal of secondary motives which, once aroused, are likely to persist. If they are not aroused in sufficient strength to lead to a choice of the more distant goal on the first occasion, the verbalized response appears still to increase the probability of their later arousal. The secondary motives supporting the choice of the more distant goal, it would then have to be supposed, are somehow more dependent upon explicit descriptions of the situation than are those supporting the choice of the nearer goal.

TABLE 5

Relation of Verbalization on First Day to Consistency of Choice

Statement on first day	Subjects choosing distant goal on first day		Subjects choosing near goal on first day	
	N	% making same choice (distant goal) on second day	N	% making same choice (near goal) on second day
None	85	43	170	73
Denotative	21	52	95	80
Descriptive	61	59	59	64

Verbalizations in the Interview

The children were interviewed after they had twice made a choice in the experimental situation. The statements made in the interview must thus in part be determined by the choices themselves. At the same time, the statements made in the interview are presumably a more or less accurate reproduction of statements made internally just before either or both choices. To the extent that the statements have this latter origin (an unknown extent, of course), they may be regarded as reflecting determinants of

the choices and of the consistency of choice. In the preceding chapter, evidence in the statements as to the determinants of the separate choices was considered. Here certain evidence as to influences on consistency will be considered.

sociated with the greatest variation in choice from one day to the next. Statements which include some generalized reason in support of either choice are associated with the greatest consistency of choice. It is this latter point that seems most important in connection with

TABLE 6

Relation of Verbalization in Interview to Consistency of Choice

Statement in interview	Subjects choosing distant goal on first day		Subjects choosing near goal on first day	
	N	% making same choice (distant goal) on second day	N	% making same choice (near goal) on second day
Merely descriptive	95	46	224	70
Candy different	43	42	70	57
Generalized	72	56	100	83

Here the character of the statements is classified in the way described at the beginning of the preceding chapter. As shown in Table 6, the relation to consistency is the same regardless of which goal was chosen on the first day. Statements which indicate a belief that the two pieces of candy are different are associated with the greatest consistency of choice. This is in accord with the role of linguistic behavior. The explicit making of a verbal response which provides the generalized cues for evoking a secondary motive is associated with consistency of behavior, even in comparison with the making of a descriptive response which may well reflect an internal generalization of the same sort.

Chapter VII

Summary and Interpretation

This study has been concerned with the determinants of children's choice between a nearer and a more distant goal. The hypothesis was proposed that a major group of these determinants would lie in the previous learning by the children. This hypothesis suggested several predictions, and an experiment was designed to test them.[15] All but one of the predictions were confirmed. The results on each, and their interpretation, are presented below.

(1) Frequency of choice of the more difficult goal increased with age, through the early grammar-school years. This fact is presumably due to changes during these years in the meaning-reactions and secondary motives and rewards learned in general life experience and evoked in the experimental situation. That there are such changes during this period is confirmed by the evidence which has been presented about the variation with age in the kinds of reasons given in the interview and about the variation with age in consistency of the two choices.[16]

(2) Choice of the more distant goal was more frequent in boys than in girls. Certain of the meaning-reactions and the motivations which were shown to underlie the choice of the more distant goal are more likely to be produced in boys than in girls, or likely to be produced in greater intensity or generality, under the conditions imposed by our culture. Notable are a drive for achievement, an anxiety about being considered lazy, a drive for fun in exercise, and the perception of situations as relevant to these interests. This finding, then, may be considered one among many facts about average cognitive and motivational differences between the sexes in our society that are being gradually established with the advance of experimental studies of motivation (9).

(3) Choice of the distant goal was more frequent in the presence of a woman experimenter than in the presence of a man experimenter. The generality of this conclusion is severely limited by the fact that the sample of experimenters was limited to one of each sex. The tentative interpretation is that many of the meaning-reactions, motives and rewards which lead to or reinforce the choice of the more distant goal are learned primarily in social interaction with a child's mother and his teachers. They should therefore more readily be evoked by generalization in an experimental situation of interaction with a woman than in one of interaction with a man.

(4) Choice of the distant goal was more frequent when climbing a ladder was required to reach it than when walking around a table was required. Some of the reasons given by the children in explanation of their behavior aid in interpreting this finding. A motive for achievement or to demonstrate willingness to exercise seems more likely to be evoked by the more challenging and unusual prospect of having to climb a ladder than by the

[15] It would not be accurate to say that the predictions were rigorously deduced; their deduction would require a great many specific assumptions which are quite independent of the main hypothesis.

[16] A purely maturational interpretation of the changes with age is of course possible. In the present state of knowledge it has the disadvantage that it throws no light on the other conclusions of the present study, and is not illuminated by them. The learning interpretation, on the other hand, permits a step towards interpretation of the various findings which is coherent and reciprocally illuminating.

more usual and very easy prospect of walking around a table. Similarly, climbing seems more likely to be considered as fun than does walking. The nature of the present barrier, then, influences the kind of generalization (of meaning-reactions, motives and rewards) that is likely to be made from previous learning.

(5) The presence or absence of the cue words "hard" and "easy" in the instructions to the subjects made no significant difference in the frequency of choice of the more distant goal. Here one of the predictions turned out to be false. The interpretation which will be offered here is that the cues provided by the inclusion of these words in the instructions played little or no role in determining reaction, that the arousal of relevant meaning-reactions, motivations and rewards was so conspicuously determined by the uniform aspects of the situation and by other variables (both those introduced by the experimenter and those carried in the subjects' habit systems) that the presence or absence of this one external cue had no appreciable effect. The alternative, of rejecting the entire general interpretation being offered here, would of course be more acceptable if there were another interpretation which could equally well account for all of the experimental findings including this negative one. The writer is not aware of such an alternative.

(6) The variety of reasons given by children to explain their choices gave evidence of the presence of a number of meaning-reactions and secondary motives and rewards which must depend on previous learning. Some of these reasons have been appealed to above in the interpretation of other findings. The point to be stressed here is the great variety of the reasons. This study proceeded out of a critique of Wright's proposal that tendencies to choose distant goals represent a single primary principle of behavior. If the evidence of the interviews is to be taken seriously, it is now clear that these tendencies are in fact of extremely diverse origin.

BIBLIOGRAPHY

1. Brown, J. S. Generalized approach and avoidance responses in relation to conflict behavior. Unpublished Doctoral Dissertation. Yale Univ., 1940.
2. Child, I. L. and Adelsheim, E. The motivational value of barriers for young children. *J. genet. Psychol.*, 1944, *65*, 97-111.
3. Fisher, R. A., and Yates, F. *Statistical tables for biological, agricultural and medical research.* (2nd Ed.) London: Oliver and Boyd, 1943. Pp. 98.
4. Hull, C. L. The goal gradient hypothesis and maze learning. *Psychol. Rev.*, 1932, *39*, 25-43.
5. Hull, C. L. *Principles of behavior.* New York: Appleton-Century, 1943. Pp. 442.
6. Lewin, K. *A dynamic theory of personality.* New York: McGraw-Hill, 1935. Pp. 286.
7. Miller, N. E. Experimental studies of conflict. In Hunt, J. McV. (Ed.), *Personality and the behavior disorders.* New York: Ronald, 1944. Vol. 1, Pp. 431-465.
8. Miller, N. E., and Dollard, J. *Social learning and imitation.* New Haven: Yale Univ. Press, 1941. Pp. 341.
9. Pintler, M. H., Phillips, R. and Sears, R. R. Sex differences in the projective doll play of preschool children. *J. Psychol.*, 1946, 21, 73-80.
10. Tolman, E. C. *Purposive behavior in animals and men.* New York: Century, 1932. Pp. 463.
11. Wright, H. F. The influence of barriers upon strength of motivation. *Contrib. psychol. Theor.*, 1937, Vol. 1 no. 3. Pp. 143.
12. Wright, H. F. The effect of barriers upon strength of motivation. In Barker, R. G., Kounin, J. S., and Wright, H. F. (Eds.), *Child behavior and development.* New York: McGraw-Hill, 1943. Pp. 379-396.

150.8
P974
v. 60
no. 4
Psychological monographs: general and applied - Children's preference for goals easy or difficult to obtain, by Irvin L. Child

A list of recent available PSYCHOLOGICAL MONOGRAPHS. Address orders to

American Psychological Association
1515 Massachusetts Avenue
Washington 5, D.C.

VOLUME 54, 1942

243 The Nature and Measurement of Musical Meanings. K. Brantley Watson $1.00
244 Rest Pauses in Motor Learning as Related to Snoddy's Hypothesis of Mental Growth. Hugh M. Bell ..... $ .95
245 Mental Tests as Instruments of Science. Lawrence C. Thomas $1.00
246 Fixation and Regression in the Rat. Robert W. Kleemeier ..... $ .90
247 Avoidance Conditioning and Signal Duration—A Study of Secondary Motivation and Reward. O. H. Mowrer and R. R. Lamoreaux ..... $ .90
248 Mechanization in Problem Solving—The Effect of Einstellung. A. S. Luchins $1.85

VOLUME 55, 1943

249 Studies of Ocular Behavior in Music Reading, I and II. H. E. Weaver $1.00
250 Changes in IQ at the Public School Kindergarten Level. Gelolo McHugh ..... $ .75
251 Application of the Theory of Physical Measurement to the Measurement of Psychological Magnitudes, With Three Experimental Examples. Thomas W. Reese $1.75
252 Recommendation Quality and Placement Success: A Study of the Relation Between and Estimate of the Quality of Written Recommendations and Success in Securing Certain Types of Teaching Positions. Wells Harrington $1.50
253 St. Thomas Negroes. A Study of Personality and Culture. Albert A. Campbell $2.00

VOLUME 56, 1944

254 Distal Focussing of Perception. Size-Constancy in a Representative Sample of Situations. E. Brunswick $1.00
255 Studies in Language Behavior. University of Iowa Studies in Psychology; XXIV. Edited by Wendell Johnson $2.25
256 A Study of Experimental Frustration. Alvin F. Zander ..... $ .75
257 The Relation of Frustration and Motivation to the Production of Abnormal Fixations in the Rat. James B. Klee $1.00
258 The Social and Emotional Development of Pre-School Children Under Two Types of Educational Program. George G. Thompson ..... $ .50
259 The Effect of Special Construction of Test Items on Their Factor Composition. Constance Lovell ..... $ .50
260 The Personality of Stutterers. Lavange Hunt Richardson $1.00

VOLUME 57, 1944

261 An Experimental Investigation of the Creative Process in Music. Rudolph R. Willmann $1.50
262 The Differential Effects of the Cortical Injury and Retesting of Equivalence Reactions in the Rat. Seymour Wapner $1.25
263 An Experimental Study of Punishment. William K. Estes $1.00
264 Case Lanuti: Extreme Concretization of Behavior Due to Damage to the Brain Cortex. E. Hanfmann. $1.50
265 An Experimental Application of Projective Principles to a Paper and Pencil Personality Test. Helen Sargent $1.25

VOLUME 58, 1945

266 Children's Drawings in A Projective Technique. Paula Elkisch $1.00
267 Improvability of Pitch Discrimination. Ruth F. Wyatt $1.25
268 Patterns in Parent Behavior. Baldwin, Kalhorn, and Breese. Samuel Fels Foundation for Research. $1.50
269 A Case of "Idiot Savant": An Experimental Study of Personality Organization. Scheerer, Rothmann, and Goldstein $1.25

VOLUME 59, 1945

271 Some Dynamic Aspects of Success and Failure. Beatrice Lantz ..... $ .75
272 Young Children's Play Fantasies. George R. Bach $1.50
273 Effect of Successive Interpolations on Retroactive and Proactive Inhibition. Underwood ..... $ .75
274 Investigation of a General Normality or Control Factor—Personality Testing. Paul E. Meehl $1.50
275 A Re-Performance and Re-Interpretation of the Arai Experiment in Mental Fatigue with Three Subjects. Zelma Huxtable, Miriam Harker White, Marjorie Abernethy McCartor $1.25
276 Observations on the Characteristics and Distribution of German Nazis. Helen Peak $1.25

VOLUME 60, 1946

277 An Analysis of Certain Psychological Tests Used for the Evaluation of Brain Injury. Stewart G. Armitage $1.25
278 Factors Associated with Binet IQ Changes of Preschool Children. Beth L. Wellman and Boyd R. McCandless ..... $ .75

GEORGE BANTA PUBLISHING COMPANY, MENASHA, WISCONSIN, U.S.A.